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ASSIGNMENT BOOKLET 2A

SCN1285 Science 14
Module 2: Section 1 Assignment

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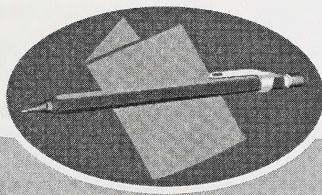
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Science 14

Module 2

Energy Transfer Technologies

ASSIGNMENT BOOKLET 2A



**Learning
Technologies
Branch**

Alberta
LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 1 Assignment	50	

Teacher's Comments

Science 14
Module 2: Energy Transfer Technologies
Assignment Booklet 2A
Section 1 Assignment
Learning Technologies Branch
ISBN 0-7741-2512-8

The Learning Technologies Branch acknowledges with appreciation the Alberta Distance Learning Centre and Pembina Hills Regional Division No. 7 for their review of this Assignment Booklet.

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	



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- Alberta Learning, <http://www.learning.gov.ab.ca>
- Learning Technologies Branch, <http://www.learning.gov.ab.ca/lrb>
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ASSIGNMENT BOOKLET 2A

SCIENCE 14: MODULE 2

SECTION 1 ASSIGNMENT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 50 marks out of the total 116 marks for the assignments in Module 2. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

50

Section 1 Assignment: Heat and Heat Transfer

Read all parts of your assignment carefully and record your answers in the appropriate places.

For questions 1 to 5, read each question carefully. Decide which of the choices BEST answers the question. Place your answer in the blank space given.

1

_____ 1. What happens to Brownian motion when you increase the temperature of the water?

- A. Brownian motion decreases
- B. Brownian motion increases
- C. Brownian motion stops
- D. Brownian motion cannot be observed

1

_____ 2. What collides with pollen grains to cause the zigzag action of Brownian motion?

- A. electrons
- B. heat
- C. protons
- D. molecules

1

_____ 3. What is the cause of heat when two pieces of wood are rubbed together?

- A. water
- B. friction
- C. radiation
- D. caloric

- ① _____ 4. Which of the following is **not** a step required to complete “Investigation 5-A: Mysterious Motion”?
- A. Pour 200 mL of cold water into a beaker or glass.
 - B. Place the beaker or glass on a table. Wait for 2 or 3 minutes or until visible motion of the water in the beaker has stopped.
 - C. The food colouring moves slowly in the water, creating strands of colour.
 - D. Draw some food colouring into the medicine dropper.
- ① _____ 5. Which reason explains why the food colouring spreads out faster in hot water than in cold water?
- A. Hot water is thinner than cold water, so the food colouring can move more easily in it.
 - B. The molecules of water in hot water are moving more slowly, allowing the food colouring to pass by.
 - C. The molecules of water in hot water are moving faster than those in cold water, colliding more often and harder with the food colouring.
 - D. The food colouring becomes thinner due to the heat from the hot water and, therefore, can move more easily.
- ③ 6. a. List three scientists mentioned in Lesson 1 who studied heat.
- _____
- ① b. Which of the scientists in question 6.a. believed in the caloric theory?
- _____

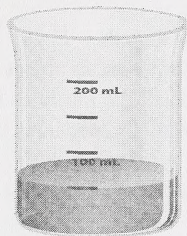


Return to page 19 of the Student Module Booklet and begin Lesson 2.

For questions 7 to 11, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

Use these diagrams to answer questions 7 and 8.

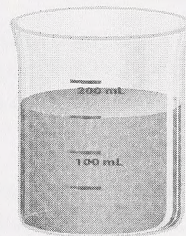
Four containers of different amounts of water at the same temperature are labelled as follows.



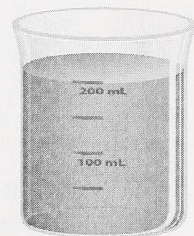
Beaker A



Beaker B



Beaker C



Beaker D

①

_____ 7. Ice cubes will melt the fastest in

- A. Beaker A
- B. Beaker B
- C. Beaker C
- D. Beaker D

①

_____ 8. Ice cubes will melt the slowest

- A. Beaker A
- B. Beaker B
- C. Beaker C
- D. Beaker D

①

_____ 9. Thermal energy (heat) is defined as

- A. the sum of all the kinetic energies of all the particles in an object
- B. the average of all the kinetic energies of all the particles in an object
- C. the sum of all the numbers of particles in an object
- D. the average number of particles in an object

- ① _____ 10. Kinetic energy is defined as
- A. a measure of the mass of an object
 - B. a measure of the amount of motion particles have
 - C. a measure of the distance between particles in an object
 - D. a measure of the number of particles in an object

- ① _____ 11. Temperature is defined as
- A. the average number of particles in an object
 - B. the average of the masses of the particles in an object
 - C. the average of the kinetic energies of all the particles in an object
 - D. the sum of all the kinetic energies of all the particles in an object

12. Read each statement carefully. Decide whether the statement is true (T) or false (F). Place your answer in the blank space given.

- ① _____ a. Heat and temperature are the same
- ① _____ b. The thermal energies (heat) of two bottles of sports drink, one 0.5 L and the other 1.5 L, lying on the beach all day are the same.
- ① _____ c. The temperatures of two bottles of sports drink, one 0.5 L and the other 1.5 L, lying on the beach all day are the same.



Return to page 22 of the Student Module Booklet and begin Lesson 3.

For questions 13 to 20, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

- ① _____ 13. Conduction of heat energy occurs when
- A. molecules of both objects are in contact with each other
 - B. heat is moved through a fluid
 - C. heat is radiated from an object
 - D. heat passes from a cooler object to a hotter one
- ① _____ 14. The process through which an entire room could become warm by turning on the oven and opening the oven door is
- A. radiation
 - B. conduction
 - C. convection
 - D. Brownian motion

- ① _____ 15. Which of the following happens to the air directly above a hot plate that is on?
- A. It sinks.
 - B. It rises.
 - C. It does not move at all.
 - D. It has molecules that vibrate only.
- ① _____ 16. In which of the following does convection occur?
- A. in concrete
 - B. a steel cable
 - C. liquids and gases
 - D. in air only
- ① _____ 17. Infrared waves are an example of heat transfer by
- A. convection
 - B. radiation
 - C. conduction
 - D. motion of the air
- ① _____ 18. Which of the following is the best conductor of heat?
- A. glass
 - B. wood
 - C. plastic
 - D. tin
- ① _____ 19. Heat registers are usually placed near the floor because
- A. cold air rises
 - B. cold air sinks
 - C. hot air rises
 - D. hot air expands
- ① _____ 20. The basement of a modern house is often heated using hot water that passes through plastic pipes in a concrete floor. Which form of heat transfer would best explain how the concrete is warmed?
- A. conduction
 - B. convection
 - C. radiation
 - D. all of the above

21. Fill in the blanks using the following terms.

- glass
- convection
- conduction
- kinetic energy
- potential energy
- radiation
- metal
- contact

- ① a. In conduction, heat is transferred through the _____ of two objects.
- ① b. The collision of high-energy molecules of a burner results in a transfer of _____ to a pot.
- ② c. Two processes involved in making air directly above a burner feel warm are _____ and _____.
- ① d. A wax bead is placed on the end of a metal rod and another on the end of a glass rod. The other end of each rod is placed over a flame. The wax bead that will melt first is the one on the _____ rod.



Return to page 28 of the Student Module Booklet and begin Lesson 4.

For questions 22 to 28, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

- ① _____ 22. The demonstration on transfer of heat in a liquid on page 92 of the textbook shows heat transfer involving which of the following?
- A. radiation
 - B. conduction
 - C. convection
 - D. gravity
- ① _____ 23. The demonstration on transfer of heat in a liquid on page 92 of the textbook shows that
- A. heat radiates in all directions in a liquid
 - B. heat is passed from one molecule to the next
 - C. heat flows as a circular current in the liquid
 - D. heat does not move in a liquid

- ① _____ 24. Convection currents in liquids move
- A. not at all
 - B. up at the point of the heat source, then toward the cooler water
 - C. down at the point of the heat source, then toward the cooler water
 - D. directly away from the heat source toward the cooler water
- ① _____ 25. Which of the following statements about a land breeze is incorrect?
- A. The sea loses heat more slowly than the land. The air over the sea is warmer.
 - B. Warm air over the sea rises.
 - C. Air over land is cooler. Cool air is more dense and sinks.
 - D. Cool air flows toward the land to replace warm air that has risen.
- ① _____ 26. Which of the following statements about a sea breeze is correct?
- A. Air over land is cooler.
 - B. Air over the water is cooler.
 - C. Air over the water is less dense and sinks.
 - D. Air over the land is more dense and sinks.
- ① _____ 27. When compared to a land breeze, a sea breeze is
- A. warm and strong
 - B. cool and weak
 - C. warm and weak
 - D. cool and strong
- ① _____ 28. The heat transfer method that causes land and sea breezes is
- A. radiation
 - B. conduction
 - C. convection
 - D. concentration

29. Fill in the blanks. Select the appropriate words from the following list. Words may be used more than once.

- | | | |
|----------------|----------|----------|
| • heats | • cooler | • rises |
| • flows toward | • sinks | • warmer |

② a. The air in a sea breeze _____ over the land and
_____ over the water.

② b. The air in a land breeze _____ over the land and
_____ over the water.

②

30. How do oceans moderate the climate of nearby landmasses?



Return to page 35 of the Student Module Booklet and begin Lesson 5.

For questions 31 to 35, read each question carefully. Decide which of the choices **BEST** completes the statement or answers the question. Place your answer in the blank space given.

①

_____ 31. Which pot would transfer heat the best?

- A. a clay pot
- B. a glass pot
- C. a stainless steel pot
- D. a steel pot with a copper bottom

①

_____ 32. The type of heat transfer that allows a pot of soup to heat evenly is

- A. conduction
- B. convection
- C. radiation
- D. conductivity

①

_____ 33. The method by which a vehicle radiator is cooled is

- A. air rushing through the radiator
- B. coolant flowing to the radiator
- C. coolant flowing away from the radiator
- D. all of the above

①

_____ 34. When a refrigerator is running, the pipes at the back feel hot because

- A. the refrigerator is too close to the wall
- B. the refrigerator has a mechanical problem
- C. the pipes have absorbed heat from the surrounding air in the room
- D. the pipes have absorbed the heat that has been transferred from the food inside the refrigerator

① _____ 35. In a refrigerator, which is the last place heat from food transfers to?

- A. fins or wires
- B. coolant in the pipes
- C. air inside the refrigerator
- D. air outside the refrigerator

② 36. Write the following terms in the order heat is transferred from one to another in a refrigerator.

- food
 - coolant
 - air inside the refrigerator
 - air outside the refrigerator
 - cooling fins or wires
-
-



Submit your completed Assignment Booklet 2A to your teacher for assessment.
Then return to page 39 of the Student Module Booklet and begin the Section 1 Review.

